

V.—*Description of Limneus involutus, Harvey, MS.* By W. THOMPSON, Vice-President of the Natural History Society of Belfast;—*with an account of the Anatomy of the Animal.* By JOHN GOODSIR, Esq.

[With a Plate.]

Limneus involutus, } Harvey, MS.
Amphipeplea involuta, }

SPEC. CHAR. Spire sunk within the outer whorl; aperture very large, extending to the apex.

The finest specimen I have examined is $5\frac{1}{2}$ lines in length, and $3\frac{1}{2}$ in breadth; volutions four, the largest enveloping the other three, of which none are visible in the profile of the shell; aperture very large, wide at the base (exposing the columella throughout its entire length) and extending to the apex of the shell, margin reflected only where it joins the pillar. Shell polished, of a pale amber colour, extremely thin, with coarse longitudinal striæ.

This species approaches the *L. glutinosus* more nearly than any other native *Limneus*, but from the circumstance of the aperture extending to the apex, has at a cursory view as great a resemblance to the *Bulla Akeræ*, Mont., as to any other British shell; a coincidence which is rendered still more remarkable by the columella presenting the same appearance in the *L. involutus* as it does in that species.

The discovery of this new and beautiful mollusk is due to my friend Wm. H. Harvey, Esq. (well known for his botanical investigations) who obtained a few specimens in a small alpine lake on Cromaylaun mountain, near the celebrated lakes of Killarney, in the month of April 1832.

The above account was read to the Linnæan Society of London in April 1834. To the present time (Sept. 1839), I have not heard of the occurrence of the species in any other locality in Ireland. The original station was visited by Mr. R. Ball and myself in June 1834, when we procured only a few small specimens. The time was however unfavourable for seeing these mollusks to any advantage, being at a very early hour in the morning, before the warmth of the sun had tempted them to leave the bottom of the lake or adjoining rivulet.

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genus *Bulla* than of the other *Limnei*, seemed so highly interesting, that I conceived that the mere description of it would be of comparatively little value without that of the animal. Its dissection was most kindly undertaken by Mr. Goodsir, to whom I am indebted for the following description, and the admirable drawing which illustrates it.

“ In structure the *Limnæus involutus* resembles the other species of the genus. When its organs are compared with those of the *L. stagnalis* as described and figured by Cuvier, they are found, with the exception of the nervous collar, and the reproductive organs, to be nearly identical in arrangement and structure (Plate I. fig. 2.).

“ In his memoir on the *Limnæus* and *Planorbis*, Cuvier describes the supra-œsophageal portion of the nervous collar as consisting on each side of three small globules, connected mesially by a narrow portion; of an infra-œsophageal ganglion composed of three masses, and of a small ganglion at the junction of the buccal apparatus and gullet. In the *L. involutus* the nervous collar presents the following arrangement (fig. 3.). On each side of the gullet and buccal mass, there are two fusiform ganglia (*a a*), connected superiorly by a straight narrow commissure (*b*), and inferiorly by four small lateral (*c c c c*) and two large median ganglia (*d d*). Anterior to these and concealed by the buccal mass are two large ganglia (*e e*), connected mesially to one another, and laterally to the middle of the lateral ganglia (*a a*), having no connexion with the six posterior ganglia. The masses (*a a*) give off near their anterior extremities two nerves, which run forward along the inferior surface of the buccal apparatus, and terminate in two small ganglia (*f f*), which are connected by a filament, and distribute nerves to the buccal mass and œsophagus. The lateral ganglia therefore have one superior commissure, consisting of a simple cord, and two inferior commissures, the posterior containing six ganglia, the anterior two. The lateral and the six posterior ganglia give off all the nerves described by Cuvier; the two anterior connecting masses supply the muscular bundles in their neighbourhood.

“The arrangement of ganglia described above is not peculiar

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to this species, as it exists also in the *L. Pereger*; and one similar but more complex has been described and figured in the 'Annales des Sciences Naturelles' for 1837, page 112, by Vanbeneden as existing in the *L. glutinosus*. Vanbeneden describes a median between the two large anterior ganglia, and another between the two small stomato-gastric ganglia.

"Cuvier in his memoirs on the *Limnæus* and on the other gasteropod mollusks, mistook the testicle for the ovary, and consequently reversed certain of the other reproductive organs. Prevost of Geneva, in a paper published in the Transactions of the Physical and Natural History Society of that place for 1828, and in another contained in the 'Annales des Sciences Naturelles' for 1833, pointed out this error, and described the very beautiful structure, by means of which the seminal fluid is conveyed along the cavity containing the eggs, without coming in contact with them. This structure may be distinctly seen in the *Helix aspersa*, in which it consists of a groove, with the orifice of the duct at both extremities, running along the inner surface of the oviduct. When the fluid is passing from the testicle this groove is converted into a temporary tube by the close apposition of its lips; a structure similar to the groove in the true ruminating stomach. The arrangement of the reproductive organs in *L. involutus*, although different from that described by Cuvier in the *L. stagnalis*, is yet similar to that given by Prevost. The testicle, *a*, fig. 2. which is situated in the extreme whorls of the shell, sends off a duct, which has attached to it in the middle of its course, small follicles (*b*) of the same diameter as itself, which appear, if carelessly examined, like duplications of the tube. The duct then becomes closely connected with the point of junction of the ovary and oviduct, runs along the latter for a short distance, and opens into the acute extremity of an oblong sac (*c*), which is closely but not intimately adherent to the oviduct. This sac appears granular from the follicular arrangement of its inner surface; it is bulbous at its anterior extremity, near which it sends off the second division of the seminal duct (*d*), which running along the terminal extremity of the oviduct, at length leaves it, and dives under the transverse muscles (*e*) of the foot, as described by Cuvier in *L. stagnalis*, again

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appears near the root of the male organ (*f*), where it is coiled up, and before terminating in the penis presents a small dilatation.

“The female organs are an ovary (*g*) which lies across the middle of the body; and an oviduct (*h*) which is dilated and sacculated transversely along its middle third. The vesicle (*i*) found in this situation in the gasteropod mollusks opens by a short neck at the termination of the oviduct.

“JOHN GOODSIR.”

VI.—On certain Characters in the *Crania and Dentition of Carnivora* which may serve to distinguish the subdivisions of that Order. By G. R. WATERHOUSE, Esq.*

JUDGING from the form of the skull and lower jaw, and from the structure of the teeth, the order *Carnivora* appears to consist of six families, of which the Dog, Viverra, Cat, Weasel, Bear, and Seal afford familiar examples; of these the Cats and Weasels appear to be the most truly carnivorous, and the Bears the least so.

To these six families Mr. Waterhouse applies the names *Canidæ*, *Viverridæ*, *Felidæ*, *Mustelidæ*, *Ursidæ*, and *Phocidæ*.

In the first of these families (the *Canidæ*) the muzzle is elongated; the bony palate terminates in a line with the hinder margin of the posterior molars, or even in advance of that line, and in this respect differs from other *Carnivora*; the posterior portion of the skull is short, and there are two true molars on either side, both of the upper and lower jaw.

The principal genera contained in this family are *Canis*, *Fennecus*, *Lycaon*, and *Megalotis*. In the form of the lower jaw, and in dentition, the last-mentioned genus affords a most remarkable exception to the other *Carnivora*, and the palate terminates behind the line of the posterior molars; there may be some doubt therefore as to its real situation.

The *Viverridæ* have the same general form of skull as the *Canidæ*, but differ in having the posterior portion more produced; the bony palate is carried further back, and the small back molar observable in the lower jaw of the Dogs is here wanting; they have, therefore, but one true molar on either side of the lower jaw, and two true molars on each side of the upper jaw.

To this family belong the genera *Paradoxurus*, *Cynogale* (which

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